

### REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the following discussion and present amendment, is respectfully requested.

Claims 1-3, 5-13, 15-19, and 21-23 are pending. Claims 1 and 2 are amended. Claim 20 is canceled by the present amendment. Claims 4 and 14 were canceled previously. Support for the amendment to Claim 1 is detailed below, and support for the amendment to Claim 2 is self-evident in light of the amendment to Claim 1. No new matter is added. Claims 18 and 19 are withdrawn.

In the outstanding Office Action, Claims 1-3, 5-13, 15-17, and 20-23 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claims 1-3, 5-13, 15-17, and 20-23 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Claims 1, 6-11, 15-17, 22, and 23 were rejected under 35 U.S.C. § 103(a) as obvious over Verger et al. (WO 03/060370) in view of Matsuki (U.S. Patent No. 3,870,351). Claims 2-5, 20, and 21 were rejected under 35 U.S.C. § 103(a) as obvious over Verger, Matsuki, and Metcalfe (WO 98/42947). Claims 12 and 13 were rejected under 35 U.S.C. § 103(a) as obvious over Verger, Matsuki, and Klementich (U.S. Patent No. 5,462,315).

#### **112 Rejections**

Regarding the rejection of Claim 1 as failing to comply with the written description requirement, that rejection is respectfully traversed by the present response. Amended Claim 1 recites, in part:

said second tubular element is disposed on each of two opposing ends of a female/female connection sleeve, separated by a central portion initially provided, with an outer annular surface, said outer annular surface having a diameter smaller than the outer diameter of the annular surface of portions of the sleeve provided with the female thread, the diameter of the outer annular surface of the central portion being selected such that the

section of the sleeve in the region of this outer annular surface is greater than or equal to the smallest of the critical sections of the threaded elements of the joints, each second abutment surface rests against the corresponding third abutment surface and/or each first abutment surface rests against the corresponding fourth abutment surface,

wherein the outer annular surface extends, axially, from an innermost end of the female thread on a first of the two opposing ends of the female/female connection sleeve to an innermost end of the female thread on a second of the two opposing ends of the female/female connection sleeve,

Regarding support for the amendment to Claim 1, please see the specification, page 11, lines 1-6, which state:

[T]he central portion PCM of the sleeve M comprises an annular groove G2 (also referred to as a "lunular") locally defining, over an outer surface, a zone of reduced thickness centered on the plane of symmetry PSM.

It is clear that the word "reduced", in this excerpt from the specification, is to be understood as "smaller than the virtual case of the same portion without the annular groove (G2)".

The annular groove is "over an outer surface", "centered on the plane of symmetry" and in the context of tubular elements. Consequently, this annular groove would be easily identified by a person of ordinary skill in the art as an outer diameter smaller than a diameter in another portion of the same element. The groove is arranged in an axially localized portion. The "reduced thickness" is a consequence of the smaller outer diameter.

To make the claim even clearer, Applicants have deleted certain words which could have a chronological interpretation ("*reduced*" and "*initial*") and use a comparison with a reference of another portion: "*smaller than*". Thus, Applicants have clarified the referenced structure. This reference has to be a diameter too. The smaller diameter being axially localized, the reference is a portion not comprised in the central portion (PCM), which means, here, a "*portion of the sleeve provided with the female thread*". Accordingly, Applicants respectfully submit that no new matter is added.

**Claim 1: Axial location of the outer annular surface with a small diameter (ex “annular zone”)**

The outstanding Office Action asserts that there is no teaching in the application concerning the axial extent of the annular zone in the original disclosure (page 3, lines 5-7 of the Official Action).

Applicants refer to the specification for discussion of this feature. For example, see page 11, lines 1-3, stating:

... the central portion PCM of the sleeve M comprises an annular groove G2 (also referred to as a “lunula”) locally defining, over an outer surface, a zone of reduced thickness centered on the plane of symmetry PSM.

(page 11, lines 15-18)

... the lunula extends substantially between the two third axial abutment surfaces SB3 of the two opposing second lips L1 and L2. However, it may extend over a greater distance in particular between the last threads of the two female threads FF. The last threads are, in this case, those on the side of the third abutment surfaces SB3.

The outstanding Office Action considers that nowhere in the reply filed February 28, 2011, have the Applicants stated where in the original disclosure there is a basis for such a limitation concerning the annular zone (page 3, lines 8-13). However, page 9, lines 6-8 of the reply to Office Action, filed February 28, 2011, states: “Support for the amendments to Claims 1 and 18 can be found in the published application in numbered paragraph [0066] (page 11, lines 15-18, for example (...)).”

As discussed above, amended Claim 1 recites a comparison of a diameter with a reference diameter and recites an axial localization. The annular surface is included in the central portion. The small diameter is defined in comparison with the diameter of the axial portion containing female thread which means the annular surface is axially limited by female threads.

**Claim 1: Location of critical sections**

The word “section” is a translation from the word “section” in French (from the original PCT application). The meaning of section would be understood, here, as an area in  $\text{mm}^2$  or  $\text{inch}^2$  for example.

The outstanding Office Action considers that the Applicants are unable to specifically indicate what constitutes a critical section (page 4, lines 5-9 of the Official Action). The figure of Attachment B was made by the U.S. attorney for the Statement of Substance of Interview filed November 22, 2010. The section indicated is a not critical. This mistake has been corrected in the Reply to Office Action, filed February 28, 2011 (Attachment A of the present Final Action). The figure of Attachment B is wrong, but the figure of Attachment A is correct.

Applicants apologize for this unfortunate mistake due to a misunderstanding between the French and the U.S. attorneys.

In the reply filed February 28, 2011, page 9, Applicants specify that the words “critical section” or “critical area” are well known in the art and cited for example paragraphs [0013] and [0014] of U.S. 2001/0001219. These paragraphs follow:

[0013] Pin Critical Area=The annular cross-sectional area of the pin, in a plane positioned normal to the axis, at the largest diameter of the engaged threads.

[0014] Box Critical Area=The annular cross-sectional area of the box, in a plane positioned normal to the axis, at the smallest diameter of the engaged threads.

Claim 1 of the present application recites “(...) the smallest of the critical sections of the threaded elements of the joints (...)”

A joint comprises at least one male element and at least one female element. Each of these elements comprises one critical section. Consequently, a joint comprises at least two critical sections of elements.

It is apparent for a person skilled in the art that the critical section of the joint has to be chosen as one of the two critical sections of elements and has to be the smaller section of them. Thus, a person of ordinary skill in the art would understand the meaning of the term "critical sections" of the threaded elements of the joints," and Claim 1 recites "the smallest" of them.

Accordingly, Applicants respectfully submit that not only are the features of amended Claim 1 fully supported by the original disclosure, Claim 1 and the claims depending therefrom are clear and definite. Consequently, Applicants respectfully submit that the rejections under 35 U.S.C. §112, first and second paragraphs, are overcome.

Regarding the rejection of Claim 20 under 35 U.S.C. §112, first and second paragraphs, Claim 20 is canceled by the present amendment, and any rejection of this claim is negated.

#### **Cited Art**

Regarding the rejection of Claim 1 as obvious over Verger in view of Matsuki, that rejection is respectfully traversed by the present response.

The outstanding Office Action asserts that it is commonly understood that a sleeve typically includes two symmetrical identical joints, for example, that of Matsuki (page 6, lines 10-12 of the Official Action). Matsuki is not an example in the context of the invention recited in Claim 1 because it does not concern expandable tubular joints as the term "expandable joint" is used in the art. Applicants respectfully submit that the mere fact that physical structure such as a joint may be expanded when subjected to sufficient force does not make the joint an expandable joint as understood in the art. Rather, an expandable joint is a joint specifically designed to benefit, for example, to seal, by virtue of the expansion.

The outstanding Office Action (page 8, lines 1-9) acknowledges that Verger discloses neither the feature an annular zone having an initial reduced thickness, nor the feature of the location of the said annular zone (ex Claim 1). Applicants respectfully agree.

In addition, Verger does not disclose a diameter smaller than the outer diameter of the annular surface of portions of the sleeve provided with the female thread as recited in amended independent Claim 1.

The outstanding Office Action asserts (see page 8, lines 17-22) that in Matsuki, the annular zone has an initial reduced thickness structurally similar to that of the instant invention as defined by Claim 1. That rejection is respectfully traversed in view of the present amendment to Claim 1. In view of amended Claim 1, Matsuki does not disclose “an outer annular surface, with a diameter smaller than the outer diameter of the annular surface of portions of the sleeve provided with the female thread”.

In Fig. 1 of Matsuki, the outer surface of the female element (7) is **straight**, without an “outer annular surface, with a diameter smaller than the outer diameter of the annular surface of portions of the sleeve provided with the female thread” (as recited in amended Claim 1).

In the field of the present invention, the small outer diameter and the reduced thickness is especially made to reduce the effort needed to expand the sleeve. This technical problem is totally absent in Matsuki because it is not a connection expected to be expandable as a person of ordinary skill in the art would understand the term “expandable” in the context of expandable joints.

The feature “selected such that the section of the sleeve in the region of this zone is greater than or equal to the smallest of the critical sections of the threaded elements of the joints” is necessary in the claimed structure to avoid creating any new critical section of the assembly, i.e. weaker than all others. The existing critical sections are established and well

controlled in the claimed invention. In Matsuki, the feature has no meaning or desirability because the reduced thickness does not exist.

#### **Non-obviousness**

Matsuki (like Verger) fails to disclose the “diameter smaller than (claim 1 amended). Matsuki (like Verger) also fails to disclose the limitation of this small diameter by a minimal limit of the section.

The outstanding Office Action asserts that “in the drawings of Matsuki, his joint is made of metal and therefore the joint is expandable”. Applicants respectfully submit that there is no causal link between these two features. Matsuki’s joint is not designed to be expanded in a controlled manner as in the present invention and is thus not an expandable joint as the term “expandable joint” is understood in the art. In any case, nothing in Matsuki suggests such feature. A joint which is not especially designed to be expandable cannot be regarded as “expandable” in the meaning as claimed in the present application. The joint of Matsuki would lose all its properties if submitted to expansion, namely sealing performance, alignment of the abutting faces, make-up. These features have to be controlled to ensure a correct expansion.

Applicants respectfully submit that a person skilled in the art, reading Verger, and who is looking for an easy expansion while preserving the ability of ensuring sealing after expansion, would not look for a solution in a document dealing with a device like that of Matsuki, which is not designed to be expanded. Rather, using Matsuki would lead to loss of the tightness after expansion.

There was no apparent reason, at the time the claimed invention was made to combine Verger with Matsuki. A combination of Verger and Matsuki would not have been considered by a person skilled in the art. In any case, no reasonable combination of Verger and Matsuki would contain all features of the assembly recited in Claim 1.

The outstanding Office Action asserts that Applicants criticize the full body incorporation of Matsuki (page 18, lines 8-9) or Metcalf (page 19, lines 4-5). However, Applicants respectfully submit that, even when combined, the references fail to disclose each and every feature recited in Claim 1. A second argument is to highlight that the documents cited are so different that it is not correct to combine the teachings. In other words, a person of ordinary skill in the art has no reason to look for documents not able to preserve tightness after expansion. To think the contrary results from an *a posteriori* reconstruction.

The assertion that Verger and Matsuki are the same “art” because they deal with tubular joints is not correct because the technical problems are very different in a tube made to be kept in an original state and another made to be expanded.

Regarding the rejection of Claim 2 as obvious over Verger, Matsuki, and Metcalf, that rejection is respectfully traversed by the present response.

#### **Introduction (see Annex 1 enclosed)**

In a hydrocarbon well or similar well there is a “casing” string and a “production tubing” string. The annular space at the bottom of a casing string between the casing string and the borehole is cemented. The function of the casing is to consolidate the borehole of the well and to prevent entry of water or other fluids under pressure from the ground. The casing string has also to be gas tight regarding fluids, in particular gases under pressure which may be present inside the casing string. The casing string is generally made of solid pipes with gas-tight connections. It may be continued by a liner made of solid pipes which is hung from the bottom of the casing with the same function. A recent evolution for casing pipes (or liner pipes) has consisted to use solid pipes which can be expanded without losing their tightness properties after expansion. “Solid expandable tubulars” (A) of the casing, generally disposed between the wellhead and the production zone (the reservoir containing hydrocarbon), have to be tight to prevent any fluid loss. On the contrary, a “slotted expandable liner” (B) (or

“perforated liner”), is a recent technology to collect hydrocarbons from the oil or gas formation. The slotted expandable liner extends further to the solid (expandable or standard not expandable) tubulars (A) and passes through hydrocarbon-containing formation. To prevent collapse while permitting hydrocarbon fluid flow, this “slotted expandable liner” (B) is equipped with permeable walls (for example with slots or openings) to allow fluid flow into the borehole. The slotted expandable liner (B) could also be called “sand filter” or “sand screen”. The setup of solid expandable tubular (A) and slotted expandable liner (B) is made during a step of “completion”, before the production phase.

The production tubing string, with a smaller diameter than the casing string, is inserted into the casing string. One of the functions of the tubing string is to carry the fluid to the surface. To carry the fluid to the surface, solid tubes (C) of the production tubing string have to resist to considerable pressure variations between the interior and the exterior. They are equipped with tight walls and tight connections both withstanding pressure. The solid tubes (C) unstop generally in the top of the production zone. The annulus between the solid tubes (C) of the production tubing and the bore of the casing, shortly above the production zone, is provided with a “production packer” (D). The production packer (D) isolates and stops fluid flow from bottom to annular space of the casing.

In Metcalf (paragraphs 2 and 3) there is a reference to WO 93/25800 and WO 97/21901. There is no reference to WO 93/25799.

WO 93/25800 discloses a method of completing an uncased section of a borehole. Paragraph 2 and 3 of WO 93/25800 describes “to prevent collapse of the wall of the borehole, the borehole is cased by means of a casing arranged in the borehole (...) the uncased borehole section is completed with a liner which is provided with slots to allow fluid influx into the borehole”. In other words, WO 93/25800 concerns a permeable part that is expandable by a mandrel to a diameter larger than the casing diameter thus forming a lower part of casing.

WO 97/21901 refers to WO 93/25800 (paragraph 2) and describes “it is desirable to provide a relatively long section of borehole with slotted liner. This requires two or more lengths of slotted liner to be joined together (...)” (paragraph 3). It teaches connecting permeable casing parts.

Metcalf itself describes an “expandable **slotted tubing string** and method for connecting such a tubing string” (Title). In paragraph 4 there is “According to the present invention there is provided a method for connecting lengths of expandable tubing defining overlapping longitudinal.” The presence of slots, see figures of Metcalf (references 12, 18, 64, 65 and 66), confirms the particular feature to not be tight and to let fluid passing through the walls of connector (16). Accordingly, Metcalf relates to the slotted expandable liner (B) of the casing string.

To understand the difference, it is possible to compare WO 93/25800 (about expandable slotted parts of the casing) and WO 93/25799, filed the same day by the same Applicant for solid expandable tubular parts of the casing. WO 93/25800 discloses “a system of two or more slotted liners arranged in the other” (page 6, lines 8-9) without any mention of a sealing. WO 93/25799 discloses a “metal to metal seal” (page 3, line 19). The sealing is present in solid parts, not in slotted parts.

There is no sealing between inside and outside the connector (16) of Metcalf. In a slotted expandable liner of casing, sealing between inside and outside is of no use and is contrary to logic. Internal and external pressures are equal. For these reasons, to establish a fluid tight joint between two slotted pipes (24 and 25 on Figure 2) provides no desired effect. In Figure 2 we can see there are slots everywhere and in particular in the region of the threads (26 and 27 and in the region of grooves (30 and 31) and tongues (32 and 33). Accordingly, a person of ordinary skill in the art intending to achieve a seal would not look to the slotted device of Metcalf for structure providing a seal.

Regarding the Response to Arguments Section

The assembly recited in Claim 1 is able to withstand considerable pressure variation between the interior and the exterior. Verger does not contain any incitation or suggestion to combine it with Metcalf's slotted elements to ensure the sealing (after expansion).

One of the issues addressed by the assembly recited in Claim 1 (ensuring sealing) is totally absent from Metcalf. In Metcalf, the pressure difference between the interior and the exterior of the elements is null thanks to the slots. Even if a person skilled in the art looks for a solution to make the expansion easier, he would look for a device with fluid tight joint. It is important to understand that the more the pressure variation is important, more the sealing is difficult to realize. A person skilled in the art would never use Metcalf in relation to a seal. No features disclosed in Metcalf would ensure the same effect as those claimed in Claim 1.

In conclusion, a person skilled in the art reading Verger would have had no apparent reason, at the time the claimed invention was made, to combine Verger with Metcalf. A combination of Verger and Metcalf would not be considered by a man skilled in the art. In any case, no reasonable combination of Verger and Metcalf would include all the features recited in Claim 1 or any of the claims depending therefrom.

A combination of the three documents results clearly from an *a posteriori* reconstruction. The Office Action asserts a combination of Verger and Matsuki in order to recreate the application features. A person skilled in the art who does not know the application would only combine the prior documents when he has an apparent reason to do it. Here, in contrast, a person skilled in the art is deterred from considering a non-expandable device (Matsuki) or non-tight device (Metcalf).

In response to the Official Action (page 19, lines 9-10), in a test of "what the combined teachings of the references would have suggested to those of ordinary skill in the

art”, none of the documents provides an apparent reason to look for a solution in the two others which are different devices and handle other problems.

Klementich fails to remedy the deficiencies discussed above regarding Verger and Matsuki. Rather, Klementich relates to a connection between one male element and one female element.

Accordingly, Applicants respectfully submit that amended independent Claim 1 patentably distinguishes over any reasonable combination of the cited references and further, all of the claims depending from amended independent Claim 1 patentably distinguish over any proper combination of the cited references for at least the same reasons amended independent Claim 1 does.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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# Annex 1

